IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| | | |
|---|---|---|
| In re Application of: | ) | |
| | ) | |
| Claude Q.C. Hayes | ) | |
| | ) | |
| Serial No.: 10/738,471 | ) | Group Art Unit: 1794 |
| | ) | |
| Filed: December 17, 2003 | ) | Confirmation No. 8199 |

For: **HEAT ABSORBING TEMPERATURE CONTROL DEVICES THAT INCLUDE HYDROXIDE**

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

---

**APPEAL BRIEF**

---

## 1. THE REAL PARTY IN INTEREST

The real party in interest in this appeal is Claude Q.C. Hayes.

## 2. RELATED APPEALS AND INTERFERENCES

Appellant knows of no related patent applications or patents under any appeal or interference proceeding.

## 3. STATUS OF CLAIMS

Currently, claims 1, 2, 5-24, 26 and 27 (all pending claims) are rejected. Claims 3-4 and 25 were previously canceled. The outstanding rejection of claims 1, 2, 5-24, 26 and 27 is appealed herein.

## 4. STATUS OF AMENDMENTS

There have been no amendments made after receipt of the final Office Action which was dated January 22, 2008. The claims remain unchanged relative to the claims presented by Appellant in a Response to Office Action submitted on November 13, 2007.

## 5. SUMMARY OF THE CLAIMED SUBJECT MATTER

There are three independent claims (claims 1, 22 and 24) in the application:

*i. Independent Claim 1*

With initial reference to claim 1, an "article of manufacture" is recited that includes: (1) a "flight data recorder" that includes heat-sensitive electronics (page 27, lines 11-17), (2) a "hydroxide" of specified formula (see below), and (3) "support means" (page 24, lines 3-15) for supporting the hydroxide "in relation to the flight data recorder." The formula for the recited hydroxide is "$M_x(OH)_y$; wherein "M" is selected from the group consisting of lithium, sodium, potassium, magnesium, calcium, beryllium, aluminum and ammonium (page 8, lines 24-28); and wherein "x" and "y" are integers." Furthermore, the hydroxide is "provided in an amount sufficient to effect a level of heat absorption so as to protect the electronics within the flight data recorder from damage based on exposure to a predetermined level of heat exposure (page 9, lines 11-17 and page 27, lines 25-19; see also page 9, lines 19-20 and subsequent exemplary calculations)." Heat absorption is effected at least in part by "irreversible decomposition of said hydroxide" and the "irreversible decomposition of the hydroxide forms a thermal insulation oxide layer around the flight data recorder (page 28, lines 15-17)."

*ii. Independent Claim 22*

Referring now to independent claim 22, an "article of manufacture" is recited. Similar to claim 1, the "article of manufacture" of claim 22 includes: (1) a "flight data recorder" that includes heat-sensitive electronics (page 27, lines 11-17), and (2) a "hydroxide" of the specified formula "$M_x(OH)_y$; wherein "M" is selected from the group consisting of lithium, sodium, potassium, magnesium, calcium, beryllium, aluminum and ammonium (page 8, lines 24-28); and wherein "x" and "y" are integers." The hydroxide is "provided in an amount sufficient to effect a level of heat absorption so as to protect the electronics within the flight data recorder from damage based on exposure to a predetermined level of heat exposure (page 9, lines 11-17 and page 27, lines 25-19; see also page 9, lines 19-20 and subsequent exemplary calculations)." Heat absorption is effected at least in part by "irreversible decomposition of said hydroxide" and the "irreversible decomposition of the hydroxide forms a thermal insulation oxide layer around the flight data recorder (page 28,

lines 15-17)." Unlike claim 1, however, the hydroxide of claim 22 is "formed into an endothermic structure (page 24, lines 9-10) that is configured and dimensioned for heat absorption positioning with respect to the flight data recorder (page 24, lines 11-15)." Thus, a distinct "support means" is not required in independent claim 22.

*iii. Independent Claim 24*

Finally, independent claim 24 recites -- in combination -- (1) "a heat absorbing control device," and (2) a "flight data recorder" that includes electronics "sensitive to heat in thermal communication with said heat absorbing control device (page 27, lines 11-17)." The heat absorbing control device includes hydroxide of the specified formula "$M_x(OH)_y$; wherein "M" is selected from the group consisting of lithium, sodium, potassium, magnesium, calcium, beryllium, aluminum and ammonium (page 8, lines 24-28); and wherein "x" and "y" are integers." The hydroxide is included "in an amount to effect a level of heat absorption...sufficient to protect the electronics within the flight data recorder from damage (page 9, lines 11-17 and page 27, lines 25-19; see also page 9, lines 19-20 and subsequent exemplary calculations)." The hydroxide "is supported in relation to said heat sensitive device" (the flight data recorder) (page 24, lines 3-15). As in the preceding independent claims, the hydroxide "effects said level of heat absorption at least in part based on an irreversible decomposition of said hydroxide...wherein [the] irreversible decomposition of the hydroxide forms a thermal insulation oxide layer around the flight data recorder (page 28, lines 15-17)."

*iv. Conclusion*

Appellant's disclosed and claimed articles of manufacture and combination overcome significant shortcomings found in the prior art by providing for nonreversible, hydroxide-based heat absorbing agents for use in heat sensitive devices, i.e., flight recorders.

For purposes of the present Appeal, the independent patentability of the dependent claims is not being argued and, thus, no additional description regarding the dependent claims is provided herein. Appellant respectfully submits that each of the dependent claims patentably distinguishes over the prior art of record for at least the reasons noted herein with respect to the independent claim from which it depends.

## 6. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. Whether claims 1, 2, 5-8, 10-13, 20, 22, 24 and 26 are obvious under 35 U.S. 103(a) based on the teachings of U.S. Patent No. 5,370,814 to Salyer ("*Salyer*") in view of the teachings of U.S. Patent No. 4,543,281 to Pedersen et al. ("*Pedersen*").

B. Whether claims 9, 17-19, 23 and 27 are obvious under 35 U.S. 103(a) based on the teachings of *Salyer* in view of *Pedersen*, and in further view of U.S. Patent No. 5,453,453 to Lamon et al. ("*Lamon*").

C. Whether claims 9, 14-16, 23 and 27 are obvious under 35 U.S. 103(a) based on the teachings of *Salyer* in view of *Pedersen*, and in further view of *Lamon* and U.S. Patent No. 4,421,661 to Claar et al. ("*Claar*").

D. Whether claims 9, 21, 23 and 27 are obvious under 35 U.S. 103(a) based on the teachings of *Salyer* in view of *Pedersen* and in further view of *Lamon* and U.S. Patent No. 5,167,876 to Lem et al. ("*Lem*").

With regard to the issues presented herein, Appellant notes that the various tertiary references (i.e., *Lamon*, *Claar*, and *Lem*) are generally relied upon by the Examiner to address specific hydroxide materials. Appellant further notes that only the initial obviousness rejection (based on the teachings of *Salyer* in view of *Pedersen*) is directed at Appellant's independent claims, i.e., claims 1, 22 and 24. The latter issues (i.e., Issues B, C, and D) pertain to obviousness rejections of specific dependent claims based in part on the aforementioned tertiary references. These latter issues, however, depend on the viability of the initial obviousness rejection and are therefore moot in the event that presiding issue (i.e., Issue A) is decided in Appellant's favor. Accordingly, Issues B-D are addressed herein only in the context of the presiding issue, i.e., Issue A.

## 7. ARGUMENT

### A. *Rejection of Claims 1, 2, 5-8, 10-13, 20, 22, 24 and 26 under 35 U.S.C. §103(a) over Salyer in view of Pedersen is Untenable*

Claims 1, 2, 5-8, 10-13, 20, 22, 24 and 26 under 35 U.S.C. 103(a) stand rejected as being unpatentable over *Salyer* in view of *Pedersen*. By the Office Action dated January 22, 2008, the Examiner made this rejection final, indicating that Appellant's contrary arguments had been fully considered, but were not persuasive. Appellant respectfully submits that the Examiner's final rejection is improper as to each of the present claims, and respectfully requests that the Board so find.

Appellant respectfully submits that the outstanding rejection of the present claims is improper for multiple reasons. More particularly and with particular reference to independent claims 1, 22 and 24, Appellant respectfully submits that the Examiner has failed to set forth a sustainable *prima facie* case in support of the outstanding 35 U.S.C. §103 rejection. As is well known, the factual inquiries for evaluating "obviousness" under 35 U.S.C. §103 are set forth in *Graham v. John Deere Co.*, 383 U.S. 1 (1966). These factors require that the Examiner: (1) determine the scope and content of the prior art, (2) ascertain the differences between the prior art and the claims-at-issue, (3) resolve the level of ordinary skill in the pertinent art, and (4) consider objective evidence present in the application (if any) indicating obviousness or nonobviousness.[1]

More particularly, Appellant respectfully submits that the Examiner has not satisfied his burden of proof regarding *prima facie* obviousness. The following passage from the MPEP sets forth the Examiner's burden in this regard.

> The examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. If the examiner does not produce a *prima facie* case, the Applicant is under no obligation to submit evidence of nonobviousness. ... The initial evaluation of *prima facie* obviousness ... relieves both the examiner and the applicant from evaluating evidence beyond the prior art and the evidence in the specification until the art has been shown to suggest the claimed invention. ... To reach a proper determination under 35 U.S.C. 103, the examiner must step backward in time and into the shoes worn by the hypothetical "person of ordinary skill in the art" when the invention was unknown and just before it was made. In view of all factual information, the examiner must then make a determination whether the

[1] Appellant does not contend that "objective evidence" of nonobviousness is presented on the current record.

> claimed invention "as a whole" would have been obvious at that time to that person. Knowledge of applicant's disclosure must be put aside in reaching this determination, yet kept in mind in order to determine the "differences", conduct the search and evaluate the "subject matter as a whole" of the invention. The tendency to resort to "hindsight" based upon the applicant's disclosure is often difficult to avoid due to the very nature of the examination process. However, impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior art. MPEP, §2142.

MPEP §2142 further states that "the ultimate determination of patentability is based on the entire record, by a preponderance of evidence, with due consideration to the persuasiveness of any arguments and any secondary evidence." *See also* In re Oetiker, 977 F.2d 1443(Fed. Cir. 1992). Appellant notes that the "preponderance of evidence" standard requires that the evidence of obviousness presented by the Examiner be more convincing than the evidence offered in opposition. Thus, the Examiner must demonstrate that the evidence as a whole shows that the legal determination of obviousness is more probable than not.

The Federal Circuit has stated that "rejections on obviousness cannot be sustained with mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." In re Kahn, 441 F.3d 977, 988 (Fed. Cir. 2006). The mere fact that references can be combined or modified does not render the resultant combination obvious *unless the results would have been predictable to one of ordinary skill in the art*. KSR International Co. v. Teleflex Inc., 82 USPQ2d 1385, 1396 (2007); emphasis added. Moreover, where the teachings of two or more prior art references conflict, the examiner must weigh the power of each reference to suggest solutions to one of ordinary skill in the art, considering the degree to which one reference might accurately discredit another. In re Young, 927 F.2d 588 (Fed. Cir. 1991). MPEP §2143.01 notes that both (1) "a proposed modification [that] would render the prior art invention being modified unsatisfactory for its intended purpose" and (2) "a proposed modification or combination of the prior art [that] would change the principle of operation of the prior art invention being modified" would therefore render insufficient a *prima facie* claim of obvious. *See also* In re Gordon, 733 F.2d 900 (Fed. Cir. 1984) and In re Ratti, 270 F.2d 810 (CCPA 1959).

With specific reference to the proposed combination of *Salyer* and *Pedersen*, Appellant respectfully submits that the outstanding obviousness rejections of independent claims 1, 22 and 24 are untenable because, *inter alia*, the Examiner has: (1) incorrectly determined the scope of the prior

art, (2) failed to properly and completely acknowledge the extent of the differences between the prior art and the claims-at-issue, and (3) applied an improperly "high level of skill" in harmonizing the differences therebetween. For at least the foregoing reasons and as discussed in detail below, Appellant respectfully submits that independent claims 1, 24 and 26 patentably distinguish over the proposed *Salyer/Pedersen* combination. Moreover, claims 2, 5-8, 10-13, 20 and 26, which depend directly or indirectly from the noted independent claims, are patentable for at least the reasons noted with respect to such independent claims.

Proposed Combination of *Salyer* and *Pedersen* Represents Impermissible Hindsight Reconstruction Based Upon Appellant's Disclosure

In the outstanding Office Action from which the present appeal is taken, the Examiner states that the primary reference, i.e. *Salyer*, "teaches in combination a flight data recorder (reference number 20, Figure 2 and abstract) within an inner housing (reference number 22, Figure 2), which is surrounded and embedded within a powder-like mix of silica particles and phase change material (reference number 30, Figure 2 and abstract)." According to the Examiner, *Salyer* provides an outer housing (reference number 14, Figure 2) and silica particles, either of which functioning as "support means" for supporting the phase change material. In advancing the noted obviousness rejection, the Examiner acknowledges a crucial deficiency in the primary reference, namely:

> **Salyer fail to teach using a hydroxide as the phase change material.**
> [Office Action at page 3; emphasis added]

In an effort to address this acknowledged and fundamental deficiency of *Salyer*, the outstanding rejection draws upon *Pedersen* as a secondary reference, positing that (1) "Pedersen et al teach that aluminum hydroxide is a preferred endothermic material for use in fire or flame barrier articles, such as the article of Salyer, because the dehydration and decomposition of the aluminum hydroxide absorbs large quantities of heat per amount of aluminum hydroxide (citation omitted)," and (2) "Pedersen et al specifically teaches that the aluminum oxide absorbs heat through an irreversible decomposition and that the aluminum oxide forms a thermal insulation oxide layer after completely decomposing (citation omitted)." [Office Action at pages 3 and 7]

In attempting to bridge the gap between *Salyer* -- a "flight recorder" reference that is silent as to the potential use of an hydroxide (or any material) that advantageously undergoes irreversible decomposition to protect electronics associated with a flight data recorder --- and *Pedersen* -- a

"fire/flamer barrier" reference, the Examiner states that "one of the ordinary skill in the art would have recognized that aluminum hydroxide is used as a phase change material or endothermic material for providing a fire or flame barrier for a heat sensitive device, since it absorbs large quantities of heat per amount of material, as taught by Pedersen et al." [Office Action at page 3] As such, the Examiner concludes that "it would have been obvious to one having ordinary skill in the art at the time Applicant's invention was made to select aluminum hydroxide as the salt hydrate phase change material of Salyer, since it is a preferred material for the purpose of providing a fire or flame barrier for a heat sensitive device, since it absorbs large quantities of heat per amount of material, as taught by Pedersen et al." [Office Action at page 3]

Contrary to the positions advanced by the Examiner, Appellant respectfully submits that the sole rationale for combining the *Salyer* and *Pedersen* references in the manner proposed by the Examiner is Appellant's disclosure and -- by extension -- the claims-at-issue. To arrive at the combination relied upon in rejecting the claims-at-issue, it is necessary to ignore core teachings of the cited references. The only basis for doing so is Appellant's disclosure/claims.

More particularly, Appellant draws the Board's attention to the following key points:

- *Salyer* discloses a phase change material/silica dry powder composite for thermal protection of heat sensitive materials and specifically teaches that the "particle size of the silica is critical." [Col. 4, line 56] *Salyer* further teaches that "at about 70/30 PCM:silica, a free-flowing powder is obtained that remains free-flowing both above and below the melting temperature of the PCM." [Col 4, lines 65-68]. There is no basis for concluding -- as the Examiner has in the outstanding Office Action -- that a person of ordinary skill in the art would ignore the express teachings of *Salyer* aimed at composite systems and substitute the fire/flame barrier of *Pedersen* (absent Appellant's disclosure and the claims-at-issue).
- Furthermore, *Salyer* discloses two categories of phase change materials: (i) a first category of PCMs wherein "solid-to-liquid" transitions are contemplated (which includes salt hydrates), and (ii) a second category of PCMs wherein "liquid-to-gas" transitions are contemplated (e.g., water and ethylene glycol). [Col. 2, lines 51-68]. *Salyer* effectively defines the term "phase change material" as materials that "may be

*repeatedly converted* between solid and liquid phases and utilize their latent heats of fusion to absorb, store and release energy to heat or cool during such phase conversions." [Col. 1, lines 24-27; emphasis added] There is no basis for concluding -- as the Examiner has in the outstanding Office Action -- that a person of ordinary skill in the art would ignore the express teachings of *Salyer* with respect to "phase change materials" that support reversible heat exchange regimens and substitute the hydroxides of *Pedersen* that non-reversibly decompose (absent Appellant's disclosure and the claims-at-issue).

- In implementations of *Salyer* that employ "liquid-to-gas" transitions (e.g., water), *Salyer* expressly teaches that the phase change material (PCM itself) -- not a by-product of PCM decomposition -- is vented through a plurality of blow-out vents or plugs.[2] There is no basis for concluding -- as the Examiner has in the outstanding Office Action -- that a person of ordinary skill in the art would ignore the express teachings of *Salyer* that the phase change material itself is vented from the chamber and substitute an hydroxide of *Pedersen* that, at most, vents a by-product (absent Appellant's disclosure and the claims-at-issue).

- The fire/flame barrier material of *Pedersen* takes the form of a highly filled, polymer-based composite that includes an ethylene copolymer, aluminum hydroxide and calcium and/or magnesium carbonate. Fundamental to the design and operation of the *Pedersen* barrier material is the fact that water vapor generated from the aluminum hydroxide "produces a foaming of the polymer matrix." [Col. 2, line 52] Through such foaming process, "[t]he calcium and/or magnesium carbonates together with the aluminum oxide residue are dispersed in the resulting foamed polymer matrix." [Col. 2, lines 52-55] There is no basis for concluding -- as the Examiner has

[2] "A plurality of blow-out vents or plugs 15 are provided in the protective casing 14. The vents 15 release at a predetermined chamber pressure level to provide passages for the vaporized phase change material to exit the chamber 18." [Col. 6, lines 58-62; emphasis added] "In the case of an aircraft mishap, after the PCM has vaporized and left the chamber 18 via the vents 15, the silica remains and provides an effective layer of insulation through establishing a still air environment that reduces the rate of heat transfer across the chamber 18. With little or no PCM left in the chamber 18, the temperature of the silica will begin to increase from the outer portion of the chamber 18 (adjacent inner wall 14a), to the inner portion thereof. This will cause the dye to degrade and fade to a white color. Thus, the faded silica provides an indication as to how far inward the high temperature boundary has progressed through the silica." [Col. 7, lines 8-20; emphasis added]

in the outstanding Office Action -- that a person of ordinary skill in the art would ignore the totality of the teachings of *Pedersen* and conclude that an hydroxide could be removed from the noted composite for substitution in the system of *Salyer* (absent Appellant's disclosure and the claims-at-issue).

- The Examiner contends that "the aluminum hydroxide taught in Pedersen is a preferred chemical for protecting heat sensitive items because it absorbs large quantities of heat per amount of material," suggesting that this connection alone is sufficient to support the combination upon which Appellant's claims stand rejected. "This ability to absorb large quantities of heat per amount of material would be especially critical to one in the art of flight data recorders because there is always a concern of weight and space when building components for an airplane." This statement, however, is merely conclusory without some rational underpinning, particularly given the discordant and contradictory aspects of the two references. Appellant respectfully submits that the sole basis for making the proposed combination is Appellant's disclosure and, by extension, the claims-at-issue.

For at least the foregoing reasons, Appellant respectfully submits that the teachings of *Salyer* and *Pedersen* are divergent, contradictory and that the proposed combination advanced in the outstanding Office Action is untenable under applicable legal standards. More particularly, Appellant submits that it would not have been obvious to a person of ordinary skill in the art at the time of Appellant's invention to borrow aluminum hydroxide from *Pedersen* for incorporation into the enclosure/chamber of *Salyer*. To the contrary, a skilled artisan would more likely conclude that a salt hydrate would be an appropriate constituent only for *reversible heat absorption* and, as such, would be effective only wherein a *solid-to-liquid* transition is desired. Each of these parameters conflicts with and is contrary to Appellant's claimed invention.

Therefore, Appellant respectfully submits that the outstanding obviousness rejection seeks to pick-and-choose aspects of the two prior art teachings to arrive at Appellant's claimed invention, while disregarding teachings present therein that would prevent an artisan of ordinary skill in the art from attempting and/or making Appellant's claimed articles of manufacture and/or combination. Appellant respectfully submits that the outstanding obviousness rejections of at least independent

claims 1, 22 and 24 based on *Salyer* and *Pedersen* are inconsistent with the teachings of the respective references, represent impermissible hindsight reconstruction of Appellant's invention in disregard of substantial contrary/contradictory teachings, and should be reversed. Prompt action consistent therewith is respectfully requested from the Board.

B. *Patentability of Independent Claims 1, 22 and 24 Requires Reversal of Obviousness Rejections of Dependent Claims Based on Salyer/Pedersen/Lamon, Salyer/Pedersen/Lamon/Claar, and Salyer/Pedersen/Lamon/Lem*

With reference to the additional obviousness rejections, wherein tertiary references Lamon, Claar and Lem are relied upon for specific hydroxide-related disclosures, Appellant respectfully submits that none of these additional references, whether taken alone or in combination, cure the above-noted deficiencies with regard to the primary/secondary references (i.e., *Salyer* and *Pedersen*). Accordingly, Appellant respectfully submits that the Section 103 rejections directed to dependent claims 9, 14-19, 21, 23 and 27 are untenable and should be reversed for at least the reasons previously noted with respect to independent claims 1, 22 and 24. Prompt action by the Board consistent therewith is respectfully requested.

C. *Conclusion*

Appellant submits that the outstanding obviousness rejections of the pending claims is improper and should be reversed. If any additional charges arise with respect to this Appeal or otherwise, please charge to Deposit Account No. 503570 maintained by Appellant's attorneys.

Respectfully submitted,

Date: November 3, 2008

Basam E. Nabulsi
Reg. No. 31,645
Attorney for Appellant

McCarter & English LLP
Financial Centre, Suite A304
695 East Main Street
Stamford, CT 06901-2138
(203) 399-5920
(203) 399-5820 (fax)

## 8. CLAIMS APPENDIX

***Appealed Claims***

1. An article of manufacture for heat absorption, comprising:

(a) a flight data recorder that includes electronics that are sensitive to heat;

(b) hydroxide having a formula of $M_x(OH)_y$, wherein "M" is selected from the group consisting of lithium, sodium, potassium, magnesium, calcium, beryllium, aluminum and ammonium, and wherein "x" and "y" are integers, said hydroxide being provided in an amount sufficient to effect a level of heat absorption so as to protect the electronics within the flight data recorder from damage based upon exposure to a predetermined level of heat exposure;

(c) support means for supporting said hydroxide, said hydroxide being supportable in relation to the flight data recorder by said support means;

wherein said hydroxide effects said level of heat absorption at least in part based on an irreversible decomposition of said hydroxide; and

wherein irreversible decomposition of the hydroxide forms a thermal insulation oxide layer around the flight data recorder.

2. An article of manufacture according to claim 1, wherein the means for supporting said hydroxide comprises a retaining matrix, packaging, encapsulation, microencapsulation, enclosure or structure.

3. Canceled

4. Canceled

5. An article of manufacture according to claim 1, wherein the means for supporting said hydroxide is a closed container in which said hydroxide is located.

6. An article of manufacture according to claim 5, wherein said hydroxide lines an inner wall of the closed container.

7. The article of manufacture according to claim 1, wherein said heat sensitive device is located within and spaced from said hydroxide.

8. An article of manufacture according to claim 1, wherein said hydroxide is adhered to a flexible substrate, said flexible substrate being of sufficient flexibility to conform to the size and shape of a heat sensitive device in thermal communication with said hydroxide.

9. An article of manufacture according to claim 1, wherein said hydroxide is a mixture of at least two of Lithium Hydroxide, Sodium Hydroxide, Potassium Hydroxide, Magnesium Hydroxide, Calcium Hydroxide, Beryllium Hydroxide, Aluminum Hydroxide, and Ammonium Hydroxide.

10. An article of manufacture according to claim 1, further comprising at least one layer of insulation placed between said heat sensitive device and said support means.

11. An article of manufacture according to claim 1, further comprising at least one layer of insulation placed between said support means and a source of heat.

12. An article of manufacture according to claim 1, further comprising a hermetic seal surrounding said support means.

13. An article of manufacture according to claim 12, wherein said hermetic seal includes a vent.

14. An article of manufacture according to claim 1, wherein said hydroxide is Lithium Hydroxide.

15. An article of manufacture according to claim 1, wherein said hydroxide is Sodium Hydroxide.

16. An article of manufacture according to claim 1, wherein said hydroxide is Potassium Hydroxide.

17. An article of manufacture according to claim 1, wherein said hydroxide is Magnesium Hydroxide.

18. An article of manufacture according to claim 1, wherein said hydroxide is Calcium Hydroxide.

19. An article of manufacture according to claim 1, wherein said hydroxide is Beryllium Hydroxide.

20. An article of manufacture according to claim 1, wherein said hydroxide is Aluminum Hydroxide having a formula of $Al(OH)_3$.

21. An article of manufacture according to claim 1, wherein said hydroxide is Ammonium Hydroxide.

22. An article of manufacture for heat absorption, comprising:

(a) a flight data recorder that includes electronics that are sensitive to heat;

(b) hydroxide having a formula of $M_x(OH)_y$, wherein "M" is selected from the group consisting of lithium, sodium, potassium, magnesium, calcium, beryllium, aluminum and ammonium, and wherein "x" and "y" are integers, said hydroxide being provided in an amount sufficient to effect a level of heat absorption so as to protect the electronics within the flight data recorder from damage upon exposure to a predetermined level of heat exposure, said hydroxide being formed into an endothermic structure that is configured and dimensioned for heat absorption positioning with respect to the flight data recorder and is effective to absorb said level of heat at least in part based on an irreversible decomposition of said hydroxide;

wherein irreversible decomposition of the hydroxide forms a thermal insulation oxide layer around the flight data recorder.

23. An article of manufacture according to claim 22, wherein said hydroxide is a mixture of at least two of Lithium Hydroxide, Sodium Hydroxide, Potassium Hydroxide, Magnesium Hydroxide, Calcium Hydroxide, Beryllium Hydroxide, Aluminum Hydroxide, and Ammonium Hydroxide.

24. In combination:

(a) a heat absorbing control device that includes hydroxide in an amount to effect a level of heat absorption, said hydroxide having a formula of $M_x(OH)_y$, wherein "M" is selected from the group consisting of lithium, sodium, potassium, magnesium, calcium, beryllium, aluminum and ammonium, and wherein "x" and "y" are integers; and

(b) a flight data recorder that includes electronics that are sensitive to heat in thermal communication with said heat absorbing control device;

wherein said hydroxide is supported in relation to said heat sensitive device, and wherein said hydroxide effects said level of heat absorption that is sufficient to protect the electronics within the

flight data recorder from damage at least in part based on an irreversible decomposition of said hydroxide and wherein irreversible decomposition of the hydroxide forms a thermal insulation oxide layer around the flight data recorder.

25. Canceled

26. A combination according to claim 24, wherein said heat absorbing control device includes a support means for supporting said hydroxide in relation to said heat sensitive device.

27. A combination according to claim 24, wherein said hydroxide is a mixture of at least two of Lithium Hydroxide, Sodium Hydroxide, Potassium Hydroxide, Magnesium Hydroxide, Calcium Hydroxide, Beryllium Hydroxide, Aluminum Hydroxide, and Ammonium Hydroxide.

## 9. EVIDENCE APPENDIX

None.

## 10. RELATED PROCEEDINGS APPENDIX

None.